|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Name** | **Designation** | **Department** | **Manager** | **Topic** | **Trainer** |
| User1 | Software Engineer | Development | User20 | ReactJS, HTML, CSS, JavaScript | User30 |
| User2 | Senior Software Engineer | Development | User21 | ReactJS, HTML, CSS, JavaScript | User30 |
| User1 | Software Engineer | Development | User20 | C#, SQL | User31 |
| User3 | Analyst | Modeling | User22 | SAS, R | User32 |
| User4 | Consultant | Modeling | User23 | SAS, R | User32 |
| User5 | Analyst | Modeling | User22 | CORE, Nemo | User33 |
| User6 | Analyst | Data Solutions | User23 | SQL, Big Data | User34 |
| User7 | Consultant | Data Solutions | User23 | SQL, Big Data | User34 |
| User7 | Consultant | Data Solutions | User23 | SSIS, Tableue | User30 |

1NF:

Since ***Topic*** has multiple values. This violates the 1st NF.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Name** | **Designation** | **Department** | **Manager** | **Topic** | **Trainer** |
| User1 | Software Engineer | Development | User20 | ReactJS | User30 |
| User1 | Software Engineer | Development | User20 | HTML | User30 |
| User1 | Software Engineer | Development | User20 | CSS | User30 |
| User1 | Software Engineer | Development | User20 | JavaScript | User30 |
| User2 | Senior Software Engineer | Development | User21 | ReactJS | User30 |
| User2 | Senior Software Engineer | Development | User21 | HTML | User30 |
| User2 | Senior Software Engineer | Development | User21 | CSS | User30 |
| User2 | Senior Software Engineer | Development | User21 | JavaScript | User30 |
| User1 | Software Engineer | Development | User20 | C# | User31 |
| User1 | Software Engineer | Development | User20 | SQL | User31 |
| User3 | Analyst | Modeling | User22 | SAS | User32 |
| User3 | Analyst | Modeling | User22 | R | User32 |
| User4 | Consultant | Modeling | User23 | SAS | User32 |
| User4 | Consultant | Modeling | User23 | R | User32 |
| User5 | Analyst | Modeling | User22 | CORE | User33 |
| User5 | Analyst | Modeling | User22 | Nemo | User33 |
| User6 | Analyst | Data Solutions | User23 | SQL | User34 |
| User6 | Analyst | Data Solutions | User23 | Big Data | User34 |
| User7 | Consultant | Data Solutions | User23 | SQL | User34 |
| User7 | Consultant | Data Solutions | User23 | Big Data | User34 |
| User7 | Consultant | Data Solutions | User23 | SSIS | User30 |
| User7 | Consultant | Data Solutions | User23 | Tableue | User30 |

2NF:  
1NF and remove partial dependency. Since our PK is (Name, Topic), we have partial dependency

|  |  |  |
| --- | --- | --- |
| **Name** | **Topic** | **Trainer** |
| User1 | React | User30 |
| User1 | HTML | User30 |
| User1 | CSS | User30 |
| User1 | JS | User30 |
| User2 | React | User30 |
| User2 | HTML | User30 |
| User2 | CSS | User30 |
| User2 | JS | User30 |
| User1 | C# | User31 |
| User1 | SQL | User31 |
| User3 | SAS | User32 |
| User3 | R | User32 |
| User4 | SAS | User32 |
| User4 | R | User32 |
| User5 | CORE | User33 |
| User5 | Nemo | User33 |
| User6 | SQL | User34 |
| User6 | Big Data | User34 |
| User7 | SQL | User34 |
| User7 | Big Data | User34 |
| User7 | SSIS | User30 |
| User7 | Tableue | User30 |

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Designation** | **Department** | **Manager** |
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| User2 | Senior Software Engineer | Development | User21 |
| User3 | Analyst | Modeling | User22 |
| User4 | Consultant | Modeling | User23 |
| User5 | Analyst | Modeling | User22 |
| User6 | Analyst | Data solutions | User23 |
| User7 | Consultant | Data solutions | User23 |

3NF:   
2NF and no transitive dependency. These conditions are satisfied. So, the tables are in 3NF.  
  
BCNF:   
3NF and for every functional dependency, LHS is super key. These conditions are also satisfied. Therefore, the tables are in BCNF.